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EXAMINER				
SHINGLETON, MICHAEL B				
ART UNIT		PAPER NUMBER		
2815				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/783,499

Applicant(s)

ZIPFEL ET AL.

Examiner

Michael B. Shingleton

Art Unit

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-42, 52-58 and 63-69 is/are pending in the application.
- 4a) Of the above claim(s) 12, 18, 27-29, 40 and 52-58 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-11, 13-17, 19-26, 30-39, 41, 42 and 63-69 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

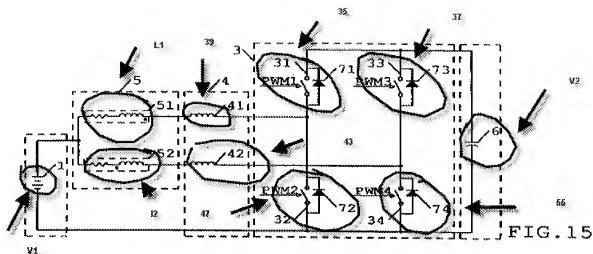
A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-11, 13-17, 19-26 and 30-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Pro et al. US 6,985,034 or Prokin WO 01/01554 (Pro). The following describes refers to the passages in the US '034 patent. However, the "WO" Prokin is the equivalent of the US '034 Patent and the passages of this are also present, but in different areas of the document.

Overview of the rejection/response to applicant's arguments:

Applicant appears to make an issue of the PWM signals being "in-phase" with transistors 35 and 37 of the disclosed invention being both roughly "on" at the same time (See page 12 around line 23 of the instant application.), as compared to what might be considered "out of phase" pwm signals of the prior art where transistor 31/PWM1 is "on" and transistor 33/PWM3 is "off" roughly at the same time in the prior art. See column 7 around line 61 of Prokin., but in actuality the baseband signals of both the prior art and the present invention that are applied to their two respective loads appear to be 180 degrees out of phase and thus the instantaneous currents through the first and second reactive loads is substantially zero just like claim 1 has been amended to read (This is addressed in the rejections in more detail.). Also the fact of the matter is that at least the independent claims are just not so limited to the PWM signals being "in-phase" as apparently meant by applicant and these claims are more directed toward the description of the function of having the baseband signals applied to the two loads being out of phase with each other which the prior art clearly, i.e. inherently, includes, as is addressed in more detail in the rejection(s). As also noted the claims just do not claim the specific structure of the transistors/switches 35, 37, 47 and 55 of Figure 4A, but even if applicant did claim the specific structure of the transistors/switches 35, 37, 47 and 55 of Figure 4A the structure is the same with that of the switches 31, 33, 32, and 34 of the prior art. The



Comparison Illustration.

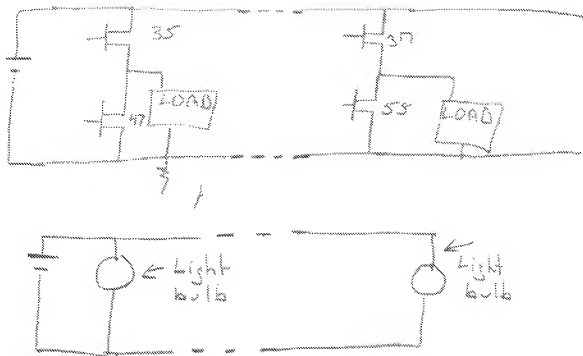
Again as stated above, the prior art has the same result as applicant's invention and as noted in the previous office action there is no difference in the inverter/load structure between the disclosed invention and the invention of the prior art. Also see the "Comparison Illustration" above. These two methods of operating, i.e. the preferred method of the prior art and the preferred method of the instant application are also looked upon as two art-recognized equivalent methods of operating the same device. Again many of the claims of applicant's invention are directed toward structure and the structure is not different between the prior art and applicant's disclosed invention. Thus this discussion between the difference between the method of the disclosed invention and the preferred method of the prior art does not have much bearing on the claims as the claims presented are not method claims but claims drawn to structure and most if not all of the claims don't even relate to the so called "in-phase" and "out-of-phase" PWM signals. However, it is important to note so as to understand the rejection and respond to applicant's arguments as these arguments are directed more toward a method and not a structure. In the disclosed method of the instant application the two baseband signals are caused to be out-of-phase by using the inverse of the baseband signal to be applied to only "one side" of the inverter structure to come up with one of the two PWM signals, i.e. the "PWM" signal. How one intends to use an old structure does not define a different or new structure. The old structure still remains an old structure. Also it has been long held that the discovery of how the prior art works does not present patentable distinction in claims drawn to structure. Also additionally as pointed out to the applicant many times in claims drawn to structure, the claims must be distinguish by structure. MPEP 2114 clearly states that "while features of

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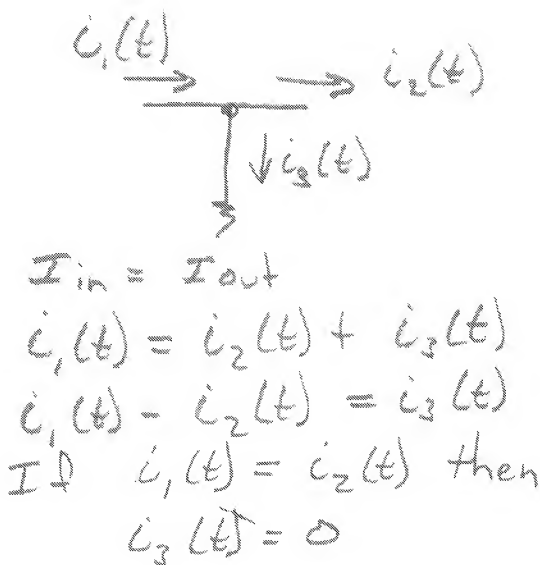
an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997)". Note that the Schreiber case was directed toward the pop corn funnel and the prior art did not recite the concept of using the prior art for pop corn, however, the structure claimed was met by the prior art. If an old structure is capable of performing the function then this old structure will clearly meet claims reciting these functions. If one applies PWM and PWM' signals to the prior art structure of Prokin such that the signals cause transistors 31 and 33 to be "on" about the same time ("in-phase") and the baseband signal super-imposed on the PWM' signal to transistors 33 and 34 of Prokin is the inverse of the baseband signal then Prokin would function exactly as the disclosed invention, so there is no question that the device of Prokin is fully capable of functioning the same as the disclosed invention. It is noted that the claims are much broader in the reciting function than in the disclosed invention, but this only shows that if applicant were to include more narrow limitations of pure intended use that the Prokin may be fully capable of performing the intended use.

The examiner also feels that it is necessary due to applicant's remarks/arguments and to make clear to others some basic engineering features involved. It is just a common fact that in circuit analysis that a DC source acts as a short to an AC signal. So applicant's invention is more in tune to two separate push-pull or inverter arrangements that share a common ground. This is like separate light bulbs connected in parallel. Prokin also recognizes this fact in its illustration of Figure 11. The illustration below illustrates the basic arrangement of both Prokin and applicant's invention. See Basic illustration 1.

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Basic Illustration 1.

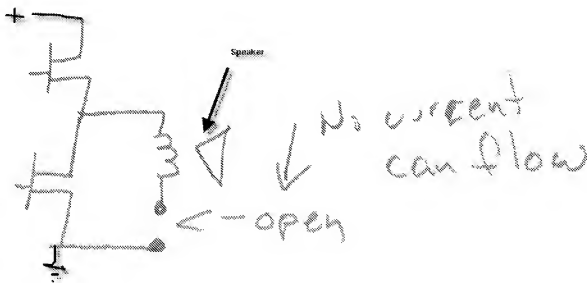


Basic Illustration 2.

When the baseband currents are equal and opposite through the two loads then there is no baseband current through the "ground lead" as illustrated above. This is what occurs in Prokin and is the subject of the alternative description of the same function of the invention as presented in claim 9 and compared to claim 1. This fact that there is no current is based on the fact that the current into a node must equal the current out of the node, a basic engineering feature. With this then what flows into this node from one load is the current that flows into the other load. Again this is what happens in Prokin as

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will be discussed in more detail below. Also note that if the DC source did not act as a short to AC, but as an open circuit then it would be impossible for the basic inverter or push pull unit like that of applicant's invention and that illustrated in Figure 11 of Prokin to have a return current path and thus the speaker would not speak or work. See Speaker Illustration number 2.



Speaker illustration number 2.

So let's look at some of the actual language of the claims including the newly presented claims like claim 1, so as to respond to applicant's remarks that will illustrate how the prior art relates to the preferred embodiment of the invention and the prior art.

Explanatory and newly amended claim 1 is reproduced below:

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2 1. (Currently Amended) Apparatus comprising
 3 at least first and second reactive loads,
 4 means for generating first and second switching signals each having respective
 5 switching band components and at least one respective baseband component, and
 6 means for applying said first and second switching signals to said first and second
 7 reactive loads, respectively,
 8 the means for generating generating the switching signals in such a way, and the
 9 means for applying applying the first and second switching signals to the first and second
 10 reactive loads in such a way that a) the sum of the values of the instantaneous currents
 11 through said each load is substantially constant zero, b) substantially all of said at least
 12 one baseband component of said first switching signal is a current that flows into said
 13 first reactive load and c) substantially all of said at least one baseband component of said
 14 second switching signal is a current that flows into said second reactive load,
 15 wherein at least one of said reactive loads is a transducer.

Claim 1 as of the latest amendment dated 12-10-2007.

With respect to: ²₃ at least first and second reactive loads,

See the elements 51 and 52 of the prior art are first and second reactive loads. In particular note that column 12 around line 6 that recites that these can be the voice coils of a speaker device.

It follows that BB amplifier is exceptionally adapted to
 5 amplify music signals in vehicles, showing all its advantages. Moreover, standard dual voice coil loudspeakers are
 made for higher power, so the application of BB amplifier
 does not require any change in the existing technology of
 loudspeaker manufacturing.

Column 12, around line 6 of the prior art.

With respect to:

4 means for generating first and second switching signals each having respective
 5 switching band components and at least one respective baseband component, and

See elements 31 and 32 are part of the means that forms a first switching signal and elements 33 and 34 that forms a second switching signal of Prokin. Compare that to the disclosed invention of Figure 4a. The switching band component is the same as that of applicant's disclosed invention and that is a square-wave and as mentioned above the device of Prokin is for an audio function (It is to power voice

coils.) wherein the baseband component is applied by the pulse width modulation of the square-wave just like that of applicant's disclosed invention. (See Figure 4a of the instant application and Figure 15 of Prokin.)

1

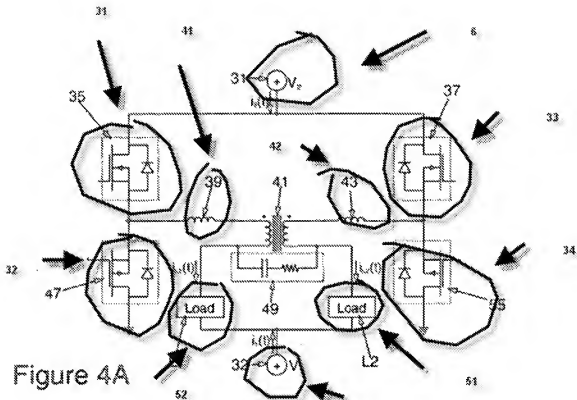


Figure 4a of the instant application.

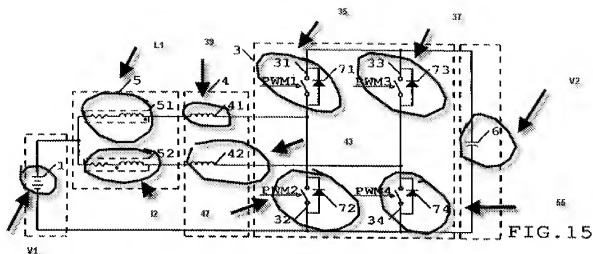


Figure 15 of Prokin.

With respect to:

- 6 means for applying said first and second switching signals to said first and second
 7 reactive loads, respectively,

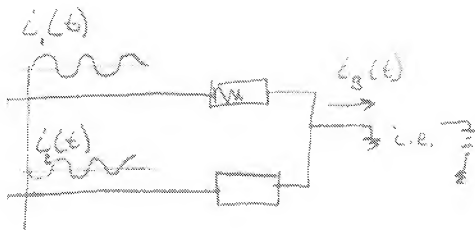
See the two wires that are used to apply the switching signals to the loads as illustrated above.

Note that other elements of the prior art could also meet this claim language limitation.

With respect to:

- 8 the means for generating generating the switching signals in such a way, and the
 9 means for applying applying the first and second switching signals to the first and second
 10 reactive loads in such a way that a) the sum of the values of the instantaneous currents
 11 through said each load is substantially constant zero.

Having the two baseband signals that are applied to the two loads being 180 degrees out of phase with each other is the only way the sum of the instantaneous current through these two loads can equal zero for all instantaneous values of the baseband signal current. See the drawing called "Sinewave illustration" below that should help see this fact.



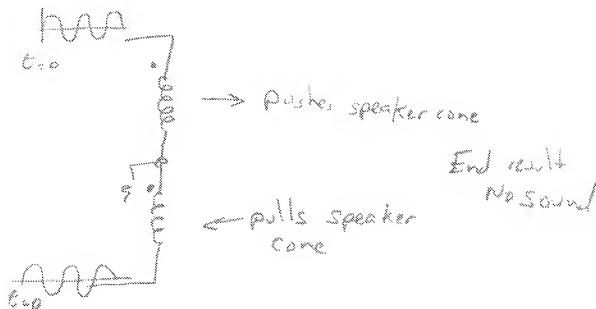
$$i_1(t) + i_2(t) = \cancel{\phi}$$

$$\text{Sine wave} + \text{Sine wave} = \text{Flat line} \quad \cancel{\phi}$$

"Sincrowave illustration"

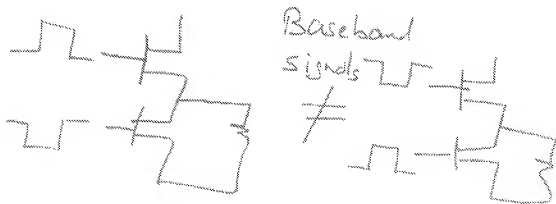
As noted above the baseband signals that are applied to the two loads in the Prokin prior art are out-of-phase just like that of applicant's invention. This inherently exists because of the "alternative" switching of the inverter transistors in the Prokin arrangement as noted above and more particularly this is further supported by the fact that in one preferred embodiment of Prokin a dual coil speaker is used. Note the "dot convention" of Figure 15. If the base band signals were not complementary or of opposite phase then the speaker would not produce any sound as the voice coils would cancel each other out. See the drawing called "Speaker illustration number 1" below that should help applicant see this fact.

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Speaker illustration number 1.

To further illustrate this fact that the baseband currents are of opposite magnitudes note the push and pull nature of the Prokin prior art, i.e. the "alternative" switching. See push pull illustration below.



Push Pull illustration.

In the Push Pull illustration note that with the exact opposite PWM signal applied to the "pull" transistor as compared to the "push" transistor the baseband signal just cannot be the same and are in fact 180 degrees out of phase with each other. To explain this in more simple terms note that when you filter out the high frequency signal what you have left is the width of the pulses defining how much the positive magnitude is (Push) and how much the "negative"(ground) magnitude is (pull). When the pull magnitude is at the highest in one push/pull arrangement the Push magnitude is at its highest in the other push/pull arrangement. In other words the baseband signals are opposite or 180 degrees out of phase between the two push/pull arrangements. (Note that the claims are drawn to structure so even if the examiner were to be incorrect in baseband signals are not the same for the two push pull circuits operated in an opposite manner as illustrated in the push pull illustration above, still applying the yet unclaimed disclosed control signals to the prior art does not impart patentability to the structure as the structure is the same and merely applying signals to an old structure that is different from the norm does not make that structure new. It is the same old structure. What applicant will be getting should this application become a patent is the right to exclude others from making the claimed structure. **There must be no "ambiguity" as to what that structure is.** See Halliburton Energy Services, Inc. v M-I LLC, Fed. Cir. 2007-1149. The examiner has constantly pointed to MPEP 2114 where the patent office requires this of the claims. Thus what is needed here in this application is clear limitations of structure to distinguish over the prior art so as to provide a clear indication to the public as to what structure applicant will be allowed to exclude others from making should this application become a patent.)

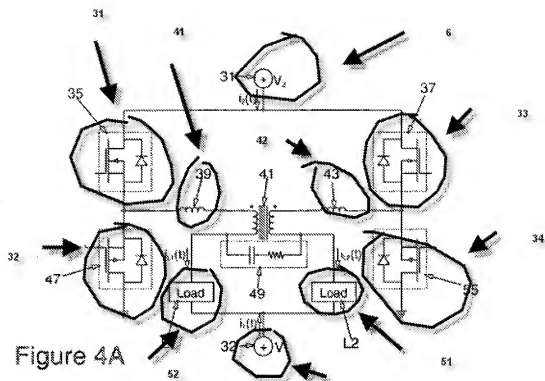
Thus the above noted claim language to a sum of the instantaneous current values to equal zero being a broad limitation is met by the prior art even with the preferred control signals applied to the prior art structure. *As the claims are not specific on what instantaneous currents applicant is talking about, these claims can be limited to baseband currents, switching frequency instantaneous currents or some combination of instantaneous current values that occur in the circuit.* It is applicant's responsibility to resolve ambiguity in the claims by amending the claims as noted the Halliburton decision (See Halliburton Energy Services, Inc v M-I LLC, Fed. Cir, 2007-1149.). Accordingly the examiner has to give the broadest reasonable interpretation to the claims in accordance to case law and the MPEP See MPEP 2111 and 2114 for example. Note that the amendment to claim 1 dated 7-12-2007 stated that the instantaneous currents would sum to be a constant value and changing the "constant" to "zero value" is

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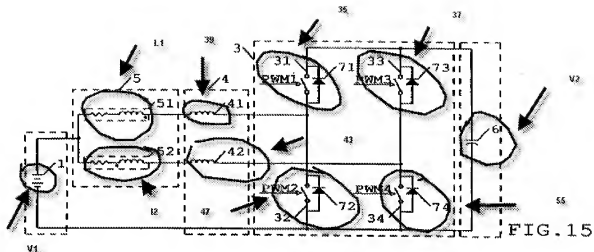
clearly newly added subject matter that necessitates the new rejection(s). Again the baseband signals through Prokin inherently and just plain has to be complementary just like that of applicant's invention. As to the affidavit presented by applicant, this seems to show that the instantaneous baseband current signals of the two signal paths would be opposite and 180 degrees out of phase just like that recited by the examiner above and thus the instantaneous currents from these signals that flows through each load would sum to be substantially zero. The newly presented claim limitation(s) when read broadly in accordance with the MPEP and case law are clearly met from the very affidavit supplied by applicant. Again the claims are broad and do not recite what the instantaneous currents referred to therein are composed of and thus any type or combination of the instantaneous currents that add to zero would meet the claims. Thus the affidavit fails as it is not compensative with the scope of the claims and since the person making the affidavit has no experience in claim construction and the broad reading of claims, this person's opinions presented in this affidavit on the reading of the claims are found unpersuasive. The person making the affidavit has absolutely no authority to limit the claims to a narrow reading, like saying the claims are limited to a combination of DC instantaneous currents as well as AC instantaneous currents ("which includes dc") just like the patent examiner has no authority to limit the claims by reading limitations into the claims that are just not there. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The affidavit also fails because as noted above and below through out this rejection, the affidavit does not address any differences in claimed structure and that of the prior art structure. Furthermore, the affidavit fails for it only tests for merely one function, i.e. for only one set of applied control signals when the Prokin reference is absolutely clearly directed that many other control signals can be used including those of applicant's invention. This is just not a comprehensive test to show that the Prokin reference is not capable of providing the claimed function. This opinion affidavit is way too narrow in view and in scope. Again the affidavit just does not include the broad reading of claims as it relates to the baseband instantaneous currents and again most certainly the affidavit does not address this issue if one applied the same control voltages to the Prokin reference or to the obvious combination(s) set forth in this and the previous rejections with the control signals of the instant application. At the very least the invention made obvious being exactly the same structure including the common mode inductor interpreted with respect to the rejection involving clm. 39 and the applying of exactly the same control signals to this structure must result in the same function as that of applicant. Furthermore, the affidavit is not persuasive since the person making the affidavit has no expertise in patent law, and cannot and does not even identify the difference in structure from the broad reading of the claimed invention to that of the prior art. Also the affidavit also seems to state that the present invention does not work. If the DC current is zero

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1057 (Fed. Cir. 1993). In other words it must be clear, i.e. not ambiguous, to more than the examiner what scope of structure the claims are limited too. It must be clear, i.e. not ambiguous, to others in the future what structure was meant by applicant. The examiner being a human being will not be around for ever to answer questions as to what the examiner thought the scope of the claim to be limited to and anyway the case law is clear that the claims themselves must be clear as one is not to read into the claims limitations that are just not there. The previous claims were definitely omnibus in nature because one could only read the structure may have been meant by applicant as what is "shown and described". Accordingly, the claims were also considered "insolubly ambiguous" (See the Halliburton decision below.). There was no "clear-cut indication of the scope of the subject matter embraced by the claim" (See Halliburton Energy Services, Inc v M-I LLC, Fed. Cir, 2007-1149.). There was no description in these claims as to any structure that applicant intended to claim as his/her invention. This was a serious matter "[b]ecause claims delineate the patentee's right to exclude, the patent statute requires that the scope of the claims be sufficiently definite to inform the public of the bounds of the protected invention, i.e., what subject matter is covered by the exclusive rights of the patent. Otherwise, competitors cannot avoid infringement, defeating the public notice function of the patent claims." (Again See Halliburton mentioned above.) Again serious "ambiguity" existed as to what structure applicant was trying to claim to the extent that one could only conclude that it was the structure "as shown and described". Just as in a single means claim being of such a breath, the specification just could not possibly be supportive of every conceivable means to perform the function. As recited in the above Halliburton decision the court says "We note that the patent drafter is in the best position to resolve ambiguity in the patent claims, and it is highly desirable that the patent examiners demand that applicants do so in appropriate circumstances so that the patent can be amended during prosecution rather than attempting to resolve the ambiguity in litigation". Also in these previously presented claims, these claims recited a "switching amplifier" as the only structure which is clearly what has already been "seen" and then these claims seems to recite functional language "at the exact point of novelty". Many times these types of claims are indefinite and as in the previous rejection these types of claims were rejected as indefinite. Again the Halliburton decision states: Claims could be held indefinite "when the inventor is painstaking when he recites what has already been seen, and then uses conveniently functional language at the exact point of novelty". The Halliburton decision recited two Supreme Court cases that "identified the dangers of using only functional claim limitations to distinguish the claimed invention from the prior art" and these are General Electric, 304 U.S. at 371 and United Carbon, 317 U.S. at 234.



Above shows the elected invention of Figure 4a. The interconnected load for the switching amplifier is shown above. While the claims lack any detail of the switching amplifier (Just now referred to as just "apparatus" in some of the claims. The examiner has cited Prokin of record for the switching amplifier is the same as that noted above. Below the examiner has provided a copy of Figure 15 of Prokin.



As recited by Prokin the bridge capacitor 6 supplies the power for the switching amplifier (See the abstract and the relevant text in the specification of Prokin.). As one can see from the above drawings the switching amplifier of Prokin is the same structure as that of applicant's elected invention. Note the four transistors. Thus the claimed structure to the switching amplifier is anticipated by Prokin in so far as the claims are understood. Note that the switching amplifier has output lines to the interconnected load and thus these are means for applying the baseband components. Note the common power supply node of element 1 of Prokin. Note that the switching amplifier of Prokin has "at least one power supply terminal" in the bridge capacitor or element 1 as set forth by at least claim 14. The four transistors like that of applicant's four transistor structure switching amplifier produces an alternating polarity of currents (See claim 22 of the instant application.). The use of PWM signals do not define any switching amplifier structure but never the less Prokin has PWM signals applied to the four transistors that make up the switching amplifier structure. The output lines are the means for supplying the two switching signals to the interconnected load (See claim 24 of the instant application.) As stated in the previous office action, if one were to connect the interconnected load to the switching amplifier of Prokin this would result in the combination functioning exactly as that of applicant's combination of switching amplifier and

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interconnected load. The examiner has tried to make this point clear in the above "Overview of the rejection/response to applicant's arguments:" above.

Thus the switching amplifier structure meets the claimed switching amplifier structure set forth in the above indicated claims. The subject matter reciting a mechanical load connected to the transducer and means for generating acoustic sonar signals, the means is the means that produces the audio signal i.e. acoustic signal and the mechanical load is not part of the structure of the apparatus. It is only the intended use of the apparatus. If you want to stick the transducer underwater to transmit sound, i.e. sonar signals, the device of Prokin is fully capable of performing the recited function. That is all that is required for a claim or limitation of intended use to be met by the prior art. The claims that present this subject matter simply do not define structure of the apparatus. As noted the two inductors 41 and 42 of Prokin form a filter and (clm. 26) one can call this a common-mode inductor as applicant has not provided any limiting definition for this term and accordingly the examiner must give the broadest reasonable interpretation to this term. The examiner has in numerous times in the past pointed out to applicant the *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) and MPEP where it was pointed out that claims drawn to structure must be distinguished from the prior art in terms of structure rather than function. From applicant's remarks it appears that applicant does not understand. Accordingly, the examiner will try to explain this in a different manner. Applicant recites that the first and second signals have a fundamental component and that they have substantial equal magnitude and phase (clms 26 and 33). (The magnitude part is not really correct because the width of one pulse of the first signal is and can be significantly different from the pulse width of the second signal (See page 12 and 13 of the original specification.)). Now the *Schreiber* case was directed to a funnel where it was intended to have popcorn applied thereto. The prior art used to reject this was a funnel but the prior art was silent on the use of having popcorn applied thereto. The prior art was held as anticipating the claimed invention because the structure was the same and as the structure was the same if one applied popcorn to the prior art the prior art was fully capable of performing the same function. An old structure is an old structure and the reciting of how one uses that structure that maybe different from the norm just does not impart patentability to that old structure. Again claims drawn to structure must be distinguished in terms of structure. In the instant case if one would apply the same PWM control signals to the switches 31, 33, 32 and 34 of the Prokin prior art reference like that applied to the switches 35, 37, 47 and 55 of Figure 4A of the instant invention, then one gets the same result of having first and second signals that are of the same phase. The ambiguity is what the structural different is if there are any structural differences. Again, in the *Halliburton* decision the court is specific in that "the patent drafter is in the best position to resolve

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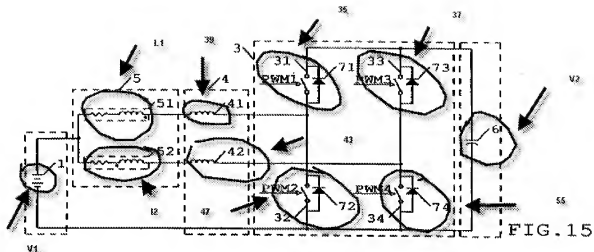
ambiguity in the patent claims, and it is highly desirable that the patent examiners demand that applicant's do so in appropriate circumstances so that the patent can be amended during prosecution rather than attempting to resolve the ambiguity in litigation." Note that applicant has not claimed the specific "bridge" style transistors or switches 35, 37, 47 and 55 nor has applicant claimed any structure that is to apply the control signals. Note that "although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims" See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The *Halliburton* decision, the *Schreiber* decision, the *Van Geuns* decision plus many others are very clear that applicant must point out in the claims the exact structural difference between that of the application and that of the prior art. If the structure is to be different from Prokin then this ambiguity is to be resolved by applicant amending the claims as the above case law makes clear. Claiming an old structure like that of Prokin and reciting function that the Prokin reference is clearly fully capable of performing does not make for a patentable distinction. Also as a side note, the examiner has pointed out that the PWM signals are "typically counter phased" in Prokin and thus other types of PWM signals can be employed like "in-phase" signals. From this the examiner just does not see the use of in-phase signals as presenting a patentable distinction as this is taught by Prokin.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 34, 35 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pro et al. US 6,985,034 or Prokin WO 01/01554 (Pro). The following describes refers to the passages in the US '034 patent. However, the WO Prokin is the equivalent of the US '034 and the passages of this are also present but in different areas of the document.



As can be seen from Figure 15 of Prokin the apparatus has two circuit paths that include at least a reactive load of 41, 42, 51 or 52. The switching amplifier is identical to that claimed as noted in the above rejection(s). There is a PWM generator or drive as indicated by the PWM signals in Prokin. Note that the loads of Prokin do form at least one transducer as elements 51 and 52 are voice coils (See column 8, around line 22). Also note that the common node of the loads of Prokin is connected to the DC voltage source 1 in the same manner that the common node of the loads L1 and L2 are connected to the DC voltage source V_1 . Prokin is silent on the specific circuit values that enables the recited function where substantially all of the current at baseband frequencies flowing in the two circuit paths flows through the respective reactive load. This is merely defining the workable range for the arrangement. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have adjusted the values of these components so as to ensure the claimed functional language is provided for as these functions are merely part of the workable/optimum range for the device and it has been long held that where the general conditions of a claim are disclosed in the prior art discovering the optimum/workable range involves only routine skill in the art.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pro et al. US 6,985,034 or Prokin WO 01/01554 (Pro) as applied to claim 34, 35 and 41 above, and further in view of Ogushwitz 5,235,559 (Ogushwitz).

Prokin disclose the basic amplifier structure as claimed but lacks the mentioning that the transducer is for acoustic sonar uses. However, the use of a speaker underwater is commonly known as a sonar transducer. See column 4, of Ogushwitz.

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Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the arrangement of Prokin in an underwater environment because as the Prokin reference is silent on the exact construction of the transducers 51 and 52 one of ordinary skill in the art would have been motivated to use any art-recognized equivalent transducer such as the one taught by Oguchwitz.

Claims 36-39 and 63-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pro et al. US 6,985,034 or Prokin WO/ 01/01554 (Both referred to as Prokin) as applied to claims 34, 35 above, and further in view of Sawashi US 6,653,897 (Sawashi).

Prokin does not show the use of a common-mode inductor (Note that in the above rejection of claim 26 since applicant does not provide a limiting specific definition of this term common-mode inductor and accordingly the inductive elements identified by the above rejection of claims 1, 3-11, 13-17, 19-26 and 30-32 are seen as meeting this broad limitation, however, this rejection rejects this subject using a different interpretation of common-mode inductor which should make it clear that such a limitation does not impart patentability over the prior art.) However, the use of a common mode inductor in a switching arrangement is common place so as to filter out the common mode component. See elements 34A and 34B of Sawashi.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a common-mode inductor in Prokin so as to filter out any common-mode component that may exist as taught by Sawashi.

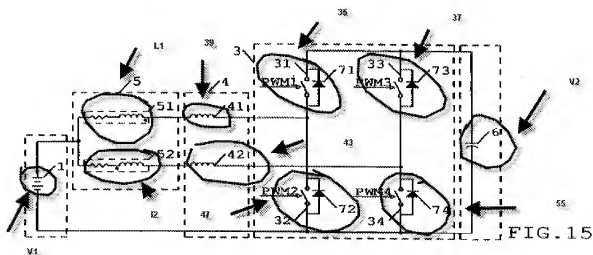
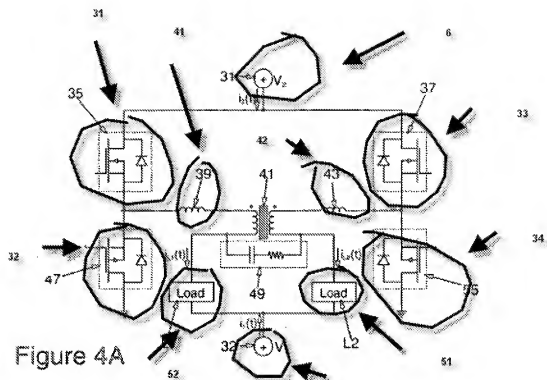
Claim 69 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pro et al. US 6,985,034 or Prokin WO 01/01554 and Sawashi as applied to claims 34-39, 41 and 63-68 above, and further in view of Oguchwitz US 5,235,559 (Oguchwitz).

Prokin disclose the basic amplifier (apparatus) structure as claimed but lacks the mentioning that the transducer is for acoustic sonar uses. However, the use of a speaker underwater is commonly known as a sonar transducer. See column 4, of Oguchwitz.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the arrangement of Prokin in an underwater environment because as the Prokin references are silent on the exact construction of the transducers 51 and 52 one of ordinary skill in the art would have been motivated to use any art-recognized equivalent transducer such as the one taught by Oguchwitz.

Applicant's arguments with respect to claims of record have been considered but are moot in view of the new ground(s) of rejection. However, the examiner offers the following comments.

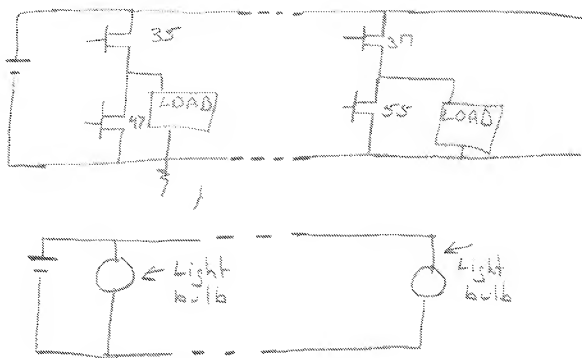
Applicant appears to make an issue of the PWM signals being "in-phase" with transistors 35 and 37 of the disclosed invention being both roughly "on" at the same time (See page 12 around line 23 of the instant application.), as compared to what might be considered "out of phase" pwm signals of the prior art where transistor 31/PWM1 is "on" and transistor 33/PWM3 is "off" roughly at the same time in the prior art. See column 7 around line 61 of Prokin., but in actuality the baseband signals of both the prior art and the present invention that are applied to their two respective loads appear to be 180 degrees out of phase and thus the instantaneous currents through the first and second reactive loads is substantially zero just like claim 1 has been amended to read (This is addressed in the rejections in more detail). Also the fact of the matter is that at least the independent claims are just not so limited to the PWM signals being "in-phase" as apparently meant by applicant and these claims are more directed toward the description of the function of having the baseband signals applied to the two loads being out of phase with each other which the prior art clearly, i.e. inherently, includes, as is addressed in more detail in the rejection(s). As also noted the claims just do not claim the specific structure of the transistors/switches 35, 37, 47 and 55 of Figure 4A, but even if applicant did claim the specific structure of the transistors/switches 35, 37, 47 and 55 of Figure 4A the structure is the same with that of the switches 31, 33, 32, and 34 of the prior art. The inverter and load structure of the prior art and the disclosed invention are the same as addressed in the previous office action.



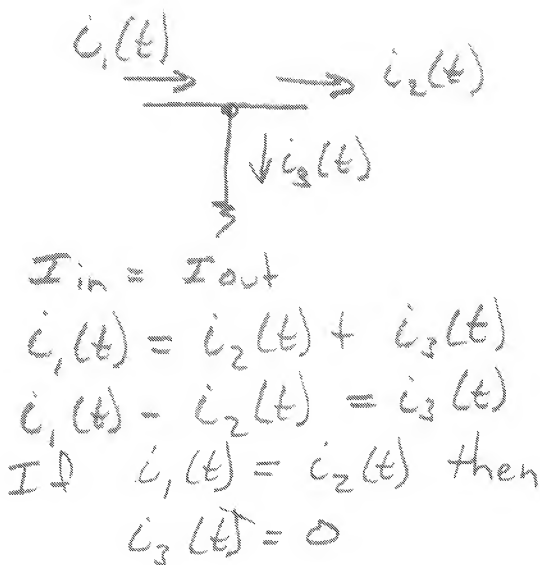
Comparison Illustration.

Again as stated above, the prior art has the same result as applicant's invention and as noted in the previous office action there is no difference in the inverter/load structure between the disclosed invention and the invention of the prior art. Also see the "Comparison Illustration" above. These two methods of operating, i.e. the preferred method of the prior art and the preferred method of the instant application are also looked upon as two art-recognized equivalent methods of operating the same device. Again many of the claims of applicant's invention are directed toward structure and the structure is not different between the prior art and applicant's disclosed invention. Thus this discussion between the difference between the method of the disclosed invention and the preferred method of the prior art does not have much bearing on the claims as the claims presented are not method claims but claims drawn to structure and most if not all of the claims don't even relate to the so called "in-phase" and "out-of-phase" PWM signals. However, it is important to note so as to understand the rejection and respond to applicant's arguments as these arguments are directed more toward a method and not a structure. In the disclosed method of the instant application the two baseband signals are caused to be out-of-phase by using the inverse of the baseband signal to be applied to only "one side" of the inverter structure to come up with one of the two PWM signals, i.e. the "PWM" signal. How one intends to use an old structure does not define a different or new structure. The old structure still remains an old structure. Also it has been long held that the discovery of how the prior art works does not present patentable distinction in claims drawn to structure. Also additionally as pointed out to the applicant many times in claims drawn to structure, the claims must be distinguish by structure. MPEP 2114 clearly states that "while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997)". Note that the Schreiber case was directed toward the pop corn funnel and the prior art did not recite the concept of using the prior art for pop corn, however, the structure claimed was met by the prior art. If an old structure is capable of performing the function then this old structure will clearly meet claims reciting these functions. If one applies PWM and PWM' signals to the prior art structure of Prokin such that the signals cause transistors 31 and 33 to be "on" about the same time ("in-phase") and the baseband signal super-imposed on the PWM' signal to transistors 33 and 34 of Prokin is the inverse of the baseband signal then Prokin would function exactly as the disclosed invention, so there is no question that the device of Prokin is fully capable of functioning the same as the disclosed invention. It is noted that the claims are much broader in the reciting function than in the disclosed invention, but this only shows that if applicant were to include more narrow limitations of pure intended use that the Prokin may be fully capable or performing the intended use.

The examiner also feels that it is necessary due to applicant's remarks/arguments and to make clear to others some basic engineering features involved. It is just a common fact that in circuit analysis that a DC source acts as a short to an AC signal. So applicant's invention is more in tune to two separate push-pull or inverter arrangements that share a common ground. This is like separate light bulbs connected in parallel. Prokin also recognizes this fact in its illustration of Figure 11. The illustration below illustrates the basic arrangement of both Prokin and applicant's invention. See Basic illustration 1.



Basic Illustration 1.



$$I_{in} = I_{out}$$

$$i_1(t) = i_2(t) + i_3(t)$$

$$i_1(t) - i_2(t) = i_3(t)$$

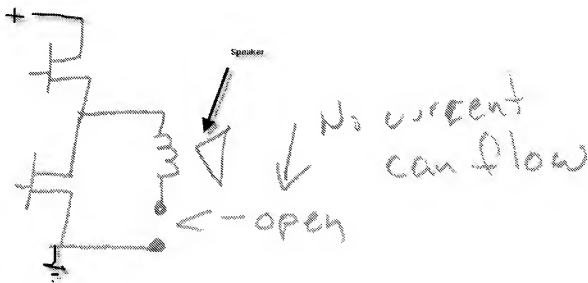
$$I \nrightarrow i_1(t) = i_2(t) \text{ then } i_3(t) = 0$$

Basic Illustration 2.

When the baseband currents are equal and opposite through the two loads then there is no baseband current through the "ground lead" as illustrated above. This is what occurs in Prokin and is the subject of the alternative description of the same function of the invention as presented in claim 9 and compared to claim 1. This fact that there is no current is based on the fact that the current into a node must equal the current out of the node, a basic engineering feature. With this then what flows into this node from one load is the current that flows into the other load. Again this is what happens in Prokin as

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will be discussed in more detail below. Also note that if the DC source did not act as a short to AC, but as an open circuit then it would be impossible for the basic inverter or push pull unit like that of applicant's invention and that illustrated in Figure 11 of Prokin to have a return current path and thus the speaker would not speak or work. See Speaker Illustration number 2.



Speaker illustration number 2.

So let's look at some of the actual language of the claims including the newly presented claims like claim 1, so as to respond to applicant's remarks that will illustrate how the prior art relates to the preferred embodiment of the invention and the prior art.

Explanatory and newly amended claim 1 is reproduced below:

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2 1. (Currently Amended) Apparatus comprising
 3 at least first and second reactive loads,
 4 means for generating first and second switching signals each having respective
 5 switching band components and at least one respective baseband component, and
 6 means for applying said first and second switching signals to said first and second
 7 reactive loads, respectively,
 8 the means for generating generating the switching signals in such a way, and the
 9 means for applying applying the first and second switching signals to the first and second
 10 reactive loads in such a way that a) the sum of the values of the instantaneous currents
 11 through said each load is substantially constant ~~zero~~, b) substantially all of said at least
 12 one baseband component of said first switching signal is a current that flows into said
 13 first reactive load and c) substantially all of said at least one baseband component of said
 14 second switching signal is a current that flows into said second reactive load,
 15 wherein at least one of said reactive loads is a transducer.

Claim 1 as of the latest amendment dated 12-10-2007.

With respect to: ²₃ at least first and second reactive loads,

See the elements 51 and 52 of the prior art are first and second reactive loads. In particular note that column 12 around line 6 that recites that these can be the voice coils of a speaker device.

It follows that BB amplifier is exceptionally adapted to
 5 amplify music signals in vehicles, showing all its advantages. Moreover, standard dual voice coil loudspeakers are
 made for higher power, so the application of BB amplifier
 does not require any change in the existing technology of
 loudspeaker manufacturing.

Column 12, around line 6 of the prior art.

With respect to:

4 means for generating first and second switching signals each having respective
 5 switching band components and at least one respective baseband component, and

See elements 31 and 32 are part of the means that forms a first switching signal and elements 33 and 34 that forms a second switching signal of Prokin. Compare that to the disclosed invention of Figure 4a. The switching band component is the same as that of applicant's disclosed invention and that is a square-wave and as mentioned above the device of Prokin is for an audio function (It is to power voice

coils.) wherein the baseband component is applied by the pulse width modulation of the square-wave just like that of applicant's disclosed invention. (See Figure 4a of the instant application and Figure 15 of Prokin.)

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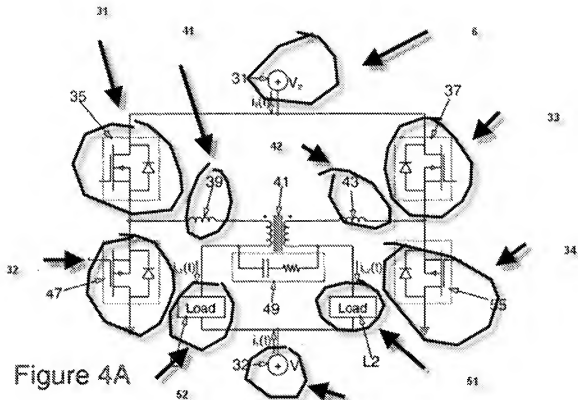


Figure 4a of the instant application.

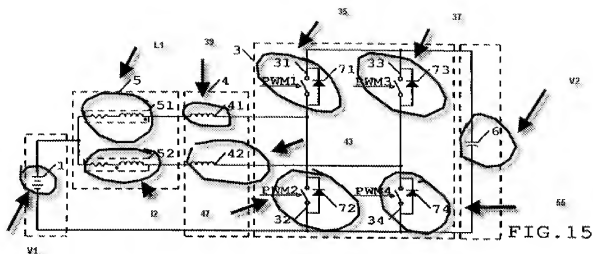


Figure 15 of Prokin.

With respect to:

- 6 means for applying said first and second switching signals to said first and second
 7 reactive loads, respectively,

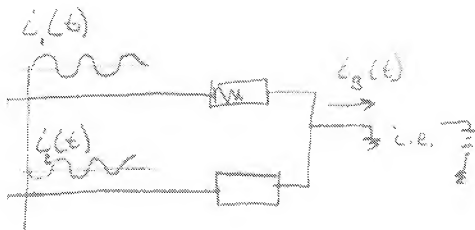
See the two wires that are used to apply the switching signals to the loads as illustrated above.

Note that other elements of the prior art could also meet this claim language limitation.

With respect to:

- 8 the means for generating generating the switching signals in such a way, and the
 9 means for applying applying the first and second switching signals to the first and second
 10 reactive loads in such a way that a) the sum of the values of the instantaneous currents
 11 through said each load is substantially constant zero.

Having the two baseband signals that are applied to the two loads being 180 degrees out of phase with each other is the only way the sum of the instantaneous current through these two loads can equal zero for all instantaneous values of the baseband signal current. See the drawing called "Sinewave illustration" below that should help see this fact.



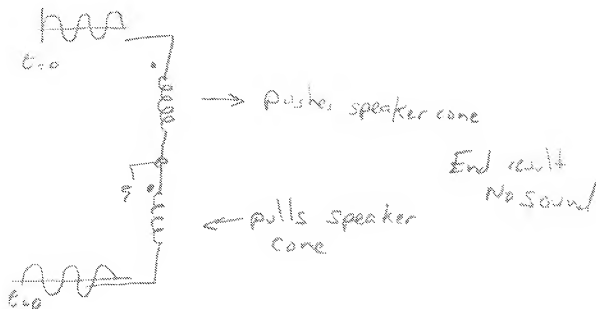
$$i_1(t) + i_2(t) = \cancel{\phi}$$

$$\text{Sine wave} + \text{Sine wave} = \text{Flat line} \quad \cancel{\phi}$$

"Sincrowave illustration"

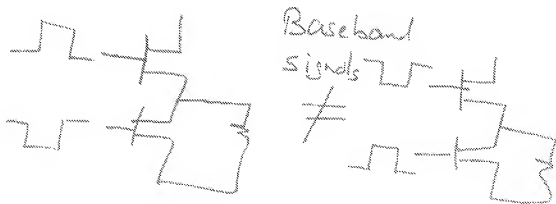
As noted above the baseband signals that are applied to the two loads in the Prokin prior art are out-of-phase just like that of applicant's invention. This inherently exists because of the "alternative" switching of the inverter transistors in the Prokin arrangement as noted above and more particularly this is further supported by the fact that in one preferred embodiment of Prokin a dual coil speaker is used. Note the "dot convention" of Figure 15. If the base band signals were not complementary or of opposite phase then the speaker would not produce any sound as the voice coils would cancel each other out. See the drawing called "Speaker illustration number 1" below that should help applicant see this fact.

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Speaker illustration number 1.

To further illustrate this fact that the baseband currents are of opposite magnitudes note the push and pull nature of the Prokin prior art, i.e. the "alternative" switching. See push pull illustration below.



Push Pull illustration.

In the Push Pull illustration note that with the exact opposite PWM signal applied to the "pull" transistor as compared to the "push" transistor the baseband signal just cannot be the same and are in fact 180 degrees out of phase with each other. To explain this in more simple terms note that when you filter out the high frequency signal what you have left is the width of the pulses defining how much the positive magnitude is (Push) and how much the "negative"(ground) magnitude is (pull). When the pull magnitude is at the highest in one push/pull arrangement the Push magnitude is at its highest in the other push/pull arrangement. In other words the baseband signals are opposite or 180 degrees out of phase between the two push/pull arrangements. (Note that the claims are drawn to structure so even if the examiner were to be incorrect in baseband signals are not the same for the two push pull circuits operated in an opposite manner as illustrated in the push pull illustration above, still applying the yet unclaimed disclosed control signals to the prior art does not impart patentability to the structure as the structure is the same and merely applying signals to an old structure that is different from the norm does not make that structure new. It is the same old structure. What applicant will be getting should this application become a patent is the right to exclude others from making the claimed structure. **There must be no "ambiguity" as to what that structure is.** See Halliburton Energy Services, Inc. v M-I LLC, Fed. Cir. 2007-1149. The examiner has constantly pointed to MPEP 2114 where the patent office requires this of the claims. Thus what is needed here in this application is clear limitations of structure to distinguish over the prior art so as to provide a clear indication to the public as to what structure applicant will be allowed to exclude others from making should this application become a patent.)

Thus the above noted claim language to a sum of the instantaneous current values to equal zero being a broad limitation is met by the prior art even with the preferred control signals applied to the prior art structure. *As the claims are not specific on what instantaneous currents applicant is talking about, these claims can be limited to baseband currents, switching frequency instantaneous currents or some combination of instantaneous current values that occur in the circuit.* It is applicant's responsibility to resolve ambiguity in the claims by amending the claims as noted the Halliburton decision (See Halliburton Energy Services, Inc v M-I LLC, Fed. Cir, 2007-1149.). Accordingly the examiner has to give the broadest reasonable interpretation to the claims in accordance to case law and the MPEP See MPEP 2111 and 2114 for example. Note that the amendment to claim 1 dated 7-12-2007 stated that the instantaneous currents would sum to be a constant value and changing the "constant" to "zero value" is

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clearly newly added subject matter that necessitates the new rejection(s). Again the baseband signals through Prokin inherently and just plain has to be complementary just like that of applicant's invention. As to the affidavit presented by applicant, this seems to show that the instantaneous baseband current signals of the two signal paths would be opposite and 180 degrees out of phase just like that recited by the examiner above and thus the instantaneous currents from these signals that flows through each load would sum to be substantially zero. The newly presented claim limitation(s) when read broadly in accordance with the MPEP and case law are clearly met from the very affidavit supplied by applicant. Again the claims are broad and do not recite what the instantaneous currents referred to therein are composed of and thus any type or combination of the instantaneous currents that add to zero would meet the claims. Thus the affidavit fails as it is not compensative with the scope of the claims and since the person making the affidavit has no experience in claim construction and the broad reading of claims, this person's opinions presented in this affidavit on the reading of the claims are found unpersuasive. The person making the affidavit has absolutely no authority to limit the claims to a narrow reading, like saying the claims are limited to a combination of DC instantaneous currents as well as AC instantaneous currents ("which includes dc") just like the patent examiner has no authority to limit the claims by reading limitations into the claims that are just not there. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The affidavit also fails because as noted above and below throughout this rejection, the affidavit does not address any differences in claimed structure and that of the prior art structure. Furthermore, the affidavit fails for it only tests for merely one function, i.e. for only one set of applied control signals when the Prokin reference is absolutely clearly directed that many other control signals can be used including those of applicant's invention. This is just not a comprehensive test to show that the Prokin reference is not capable of providing the claimed function. This opinion affidavit is way too narrow in view and in scope. Again the affidavit just does not include the broad reading of claims as it relates to the baseband instantaneous currents and again most certainly the affidavit does not address this issue if one applied the same control voltages to the Prokin reference or to the obvious combination(s) set forth in this and the previous rejections with the control signals of the instant application. At the very least the invention made obvious being exactly the same structure including the common mode inductor interpreted with respect to the rejection involving clm. 39 and the applying of exactly the same control signals to this structure must result in the same function as that of applicant. Furthermore, the affidavit is not persuasive since the person making the affidavit has no expertise in patent law, and cannot and does not even identify the difference in structure from the broad reading of the claimed invention to that of the prior art. Also the affidavit also seems to state that the present invention does not work. If the DC current is zero

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and thus the implication is that applicant's is always zero then what purpose is the DC source V1 of applicant's invention if it can never supply any DC current for all of time? Also the affidavit also appears to not consider the bias currents and voltages of the circuit so the conclusion is questionable at best as it appears to be incomplete.

With respect to:

- 8 the means for generating generating the switching signals in such a way, and the
9 means for applying applying the first and second switching signals to the first and second
10 reactive loads in such a way that
11 b) substantially all of said at least
12 one baseband component of said first switching signal is a current that flows into said
13 first reactive load and c) substantially all of said at least one baseband component of said
14 second switching signal is a current that flows into said second reactive load,

As discussed above describing basic features of the inventions, the DC voltage source is a short circuit for AC signals. An audio signal is an alternating signal, the baseband signal is an alternating signal. Thus clearly this language noted above of the claim is very broad.

With respect to:

- 15 wherein at least one of said reactive loads is a transducer.

See the description above related to the speaker as a speaker is a "transducer". This was the last limitation of presently amended claim 1 and each and every limitation is clearly present in Prokin and as such Prokin clearly anticipates the claimed invention.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker, can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MBS
April 1, 2008

/Michael B Shingleton/
Primary Examiner
Group Art Unit 2815